VULCAN

INSTALLATION, OPERATING, SERVICE AND PARTS MANUAL FOR ELECTRIC TRI-LEG FLOOR MOUNTED TILTING 2/3 JACKETED KETTLES SERIES: VELT

VELT40

Vulcan service agencies are located throughout the United States.
For location and phone number of one near you, call your local Vulcan dealer.

VULCAN-HART CORPORATION, P.O. BOX 696, LOUISVILLE, KY 40201-0696, TEL. (502) 778-2791

FORM 30004 Rev. A

1/90

IMPORTANT

OPERATING, INSTALLING AND SERVICE PERSONNEL

The operating information on this equipment has been prepared for use by qualified and/or authorized operating personnel.

All installation and service on this equipment is to be performed by qualified, certified, licensed and/or authorized installation or service personnel, with the exception of any part marked with a ☐ in front of the part number.

To obtain the name and location of an authorized Vulcan service agency, contact your Food Service Equipment dealer.

DEFINITIONS

QUALIFIED AND/OR AUTHORIZED OPERATING PERSONNEL

Qualified or authorized operating personnel are those who have carefully read the information in this manual and are familiar with the equipment's functions or have had previous experience with the operation of the equipment covered in this manual.

1. For the installation of gas piping from the outlet side of the gas meter, or the service regulator when the meter is not provided, and the connection and installation of the gas appliance, qualified installation personnel must be experienced in such work, be familiar with all precautions required, and have complied with all requirements of state or local authorities having jurisdiction. In the absence of local codes, installation must comply with National Fuel Gas Code ANSI Z223.1-latest edition.
2. For the installation of electrical wiring from the electric meter, main control box or service outlet to the electric appliance, qualified installation personnel must be experienced in such work, be familiar with all precautions required, and have complied with all requirements of state or local authorities having jurisdiction. In the absence of local codes, installation must comply with the National Electrical Code ANSI NFPA No. 70 latest edition.
3. For the installation of steam piping from the source of supply to the service inlet of the appliance, qualified installation personnel must be experienced in such work, be familiar with all precautions required, and have complied with all requirements of state or local authorities having jurisdiction.

QUALIFIED SERVICE PERSONNEL

Qualified service personnel are those who are familiar with this equipment who have been endorsed by our company. All authorized service personnel are required to be equipped with a complete set of service and parts manuals and stock a minimum amount of parts for this equipment.

SHIPPING DAMAGE CLAIM PROCEDURE

For your protection, please note that equipment in this shipment was carefully inspected and packed by skilled personnel before leaving the factory. The transportation company assumes full responsibility for safe delivery upon acceptance of this shipment.

If shipment arrives damaged:

1. **VISIBLE LOSS OR DAMAGE** — Be certain this is noted on freight bill or express receipt and signed by person making delivery.
2. **FILE CLAIM FOR DAMAGES IMMEDIATELY** — Regardless of extent of damage.
3. **CONCEALED LOSS OR DAMAGE** — If damage is unnoticed until merchandise is unpacked, notify transportation company or carrier immediately, and file "concealed damage" claim with them. This must be done within fifteen (15) days of the date the delivery is made to you. Be sure to retain container for inspection.

We cannot assume responsibility for damage or loss incurred in transit. We will, however, be glad to furnish you with necessary documents to support your claim.

PLEASE RETAIN THIS MANUAL FOR FUTURE REFERENCE

ELECTRIC TRI-LEG FLOOR MOUNTED TILTING 2/3rd JACKETED KETTLES SERIES: VELT INSTALLATION, OPERATING, SERVICE AND PARTS MANUAL

INDEX

Your Vulcan Steam Jacketed Kettle is produced with quality workmanship and material. Proper installation, usage and maintenance will result in many years of satisfactory performance.

The manufacturer suggests that you thoroughly read this entire manual and carefully follow all of the instructions provided. Save this manual for future reference.

A rating plate stating the unit model number, serial number, electrical supply that the unit requires is located on the lower right outside corner of the console.

DESCRIPTION — PAGE

DEFINITIONS OF PERSONNEL (Operating, Installation and Service) and SHIPPING DAMAGE CLAIM PROCEDURE	(Inside Front Cover)
INDEX	3
DESCRIPTION	4
CAPACITIES	4
OPERATION	4
INSTALLATION	5
CONTROLS AND SIGNALS	6, 7
OPERATING INSTRUCTIONS	7
CLEANING	8
SERVICE	
MAINTENANCE	8
LOW WATER LEVEL	8
AIR VENTING	8, 9
EXTREMELY SLOW COOKING TIME	9
KETTLE WILL NOT OPERATE WHEN TURNED ON	9
DRAW OFF VALVE LEAKING	9
KETTLE - EXPLODED VIEW	10
KETTLE PARTS	11
TILTING MECHANISM	12
TILTING MECHANISM PARTS	13
COUNTERBALANCED HINGED COVER & PARTS	14
SPRING ASSIST HINGE ASSEMBLY (Optional) & PARTS	15
DRAW OFF VALVE AND FLANGED FOOT & PARTS	16
WIRING DIAGRAM: VELT20 208V	17
WIRING DIAGRAM: VELT20 230V	18
WIRING DIAGRAM: VELT20 240V	19
WIRING DIAGRAM: VELT40, 60, 80 208V	20
WIRING DIAGRAM: VELT40, 60, 80 230V	21
WIRING DIAGRAM: VELT40, 60, 80 240V	22

DESCRIPTION

The Vulcan self-generating electric kettles in this manual are pressure vessels of double-wall stainless steel construction forming a sealed jacket around the lower two thirds of the kettle bowl surface.

The kettle bowl is the container for the food product which ideally should be a liquid or semi-liquid for complete contact with the bowl surface and to fully absorb the heat transmitted through the surface from the pressurized steam generated in the kettle jacket.

The jacket functions as a self-contained sealed chamber with a permanent solution of water and anti-freeze, deep enough to immerse and protect the replaceable electric heating elements. The water is the source of the steam.

The heating elements are thermostatically controlled to provide the dialed temperatures throughout the range from slow simmer to rolling boil.

These tilting kettles are to be permanently floor mounted on legs with adjustable flanged feet.

Each kettle is equipped with a relief valve. Options include a hinged counterbalanced stainless steel lid covering the kettle bowl opening and a stainless steel tangent draw-off valve to remove the food product from the kettle bowl.

CAPACITIES

All models end with 20, 30, 40, 60 or 80 to indicate the capacity of that kettle in gallons. For example, model VELT40 indicates a two thirds jacketed electrically powered steam kettle mounted on legs, with a capacity of 40 gallons.

OPERATION

The relief valve is plumbed towards the rear of the kettle jacket. If the pressure in the jacket reaches the rated pressure of the kettle, the relief valve will open automatically and release excessive steam pressure.

When the power switch is turned "ON" and the temperature control (thermostat) knob is dialed, the pilot light will glow and the contactors will close to bring power to the elements. The steam generation will start and continue until the water contained in the jacket reaches the thermostatic temperature, manually pre-selected, at which point the temperature (thermostat) control will de-energize and open the contactors, cutting power to the heating elements and the pilot light will go off. When the temperature of the water in the jacket drops slightly, the cycle will repeat itself, maintaining the selected cooking temperature.

The temperature required for the cooking process to function must be greater than the boiling point of the liquid food product, that is, water. The higher the temperature, the greater the steam pressure in the jacket and the quicker the cooking process. For example, steam pressurized at 30 p.s.i. reaches a temperature of 274°F.

Since air is not a good media to transfer heat, air has been removed from the kettle jacket during factory testing. The pressure gauge should indicate a vacuum in the jacket of approximately 20-25 inches of mercury when the kettle is cold or has been inoperative for some time. The kettle jacket is intended to operate as a completely sealed self-contained chamber and it is advisable not to trip the relief valve during inoperative periods since this will break the vacuum seal and allow air to enter the kettle jacket.

The temperature controls (thermostats) used on these kettles have a high temperature limit and this setting will prevent the heating elements from generating steam pressure reaching or exceeding the rated working pressure of these kettles. Should the heating elements remain energized, the valve will open and release steam from the self-contained sealed kettle jacket and lower the water level in the jacket (but the elements will still be immersed). The probe sensing the lowering of the water level in the kettle jacket will not only activate the LOW WATER level indicator pilot light but also signal the liquid level control to switch the power off and turn off the circuit to the heating elements until the water level is regained.

INSTALLATION

WARNING: ELECTRICAL AND GROUNDING CONNECTIONS MUST COMPLY WITH APPLICABLE PORTIONS OF THE NATIONAL ELECTRICAL CODE AND/OR OTHER LOCAL ELECTRICAL CODES.

A. Select a location to provide drainage directly below the draw off valve. Allow sufficient rear clearance from the wall for the kettle cover to lift upright freely without obstructions.

B. Mark anchoring hole locations through flanged adjustable feet.

C. With hole locations marked, drill holes and insert expansion plugs to accommodate 5/16" size lag bolts.

D. Reposition the kettle. On VELT models level the kettle by making necessary adjustments using the flanged feet.

E. Bolt the kettle down and seal with a high grade sealing compound. Sealant must be applied not only to bolt heads but around the flanges and must be making contact with floor surface to meet N.S.F. requirements. Wipe off excess sealant immediately.

F. A control box with power supply the same as the electrical rating of kettle should be located nearby.

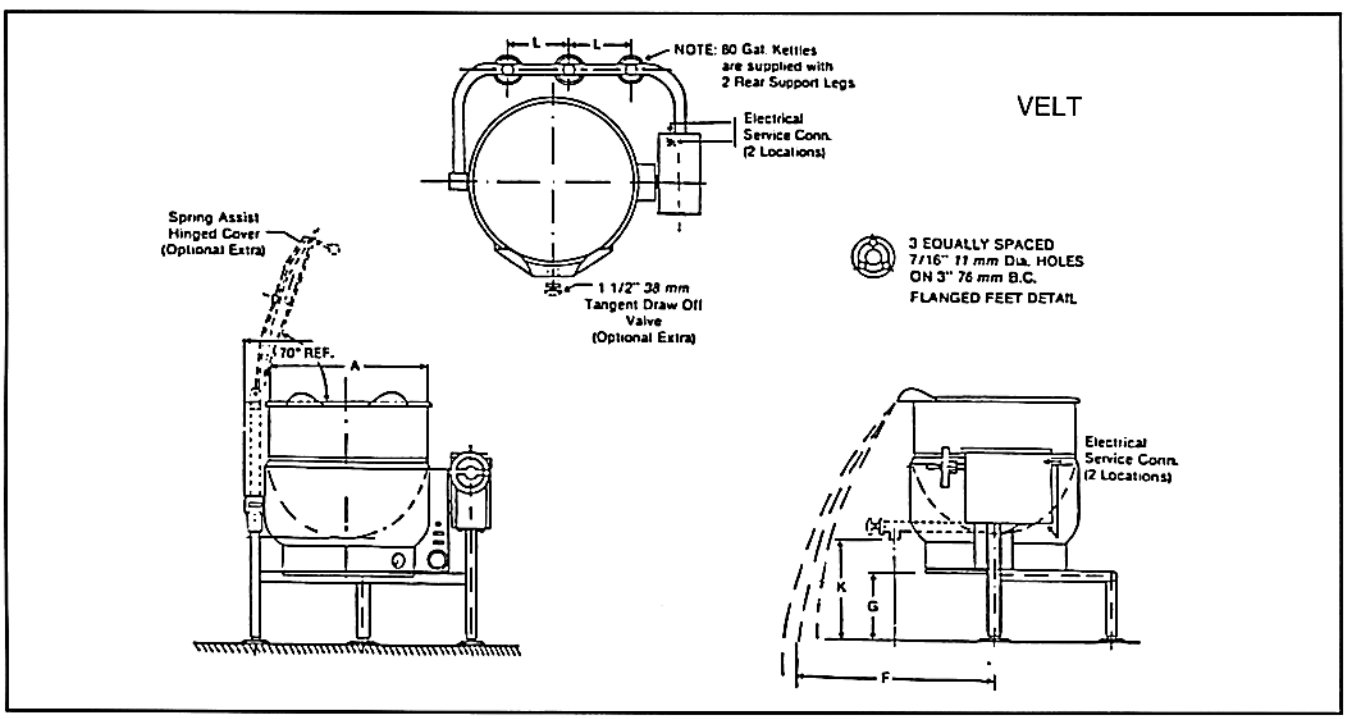
G. A water proof electrical connection for power supply to the rear of the control housing must be provided.

H. Ground the kettle to the terminal provided inside the control housing.

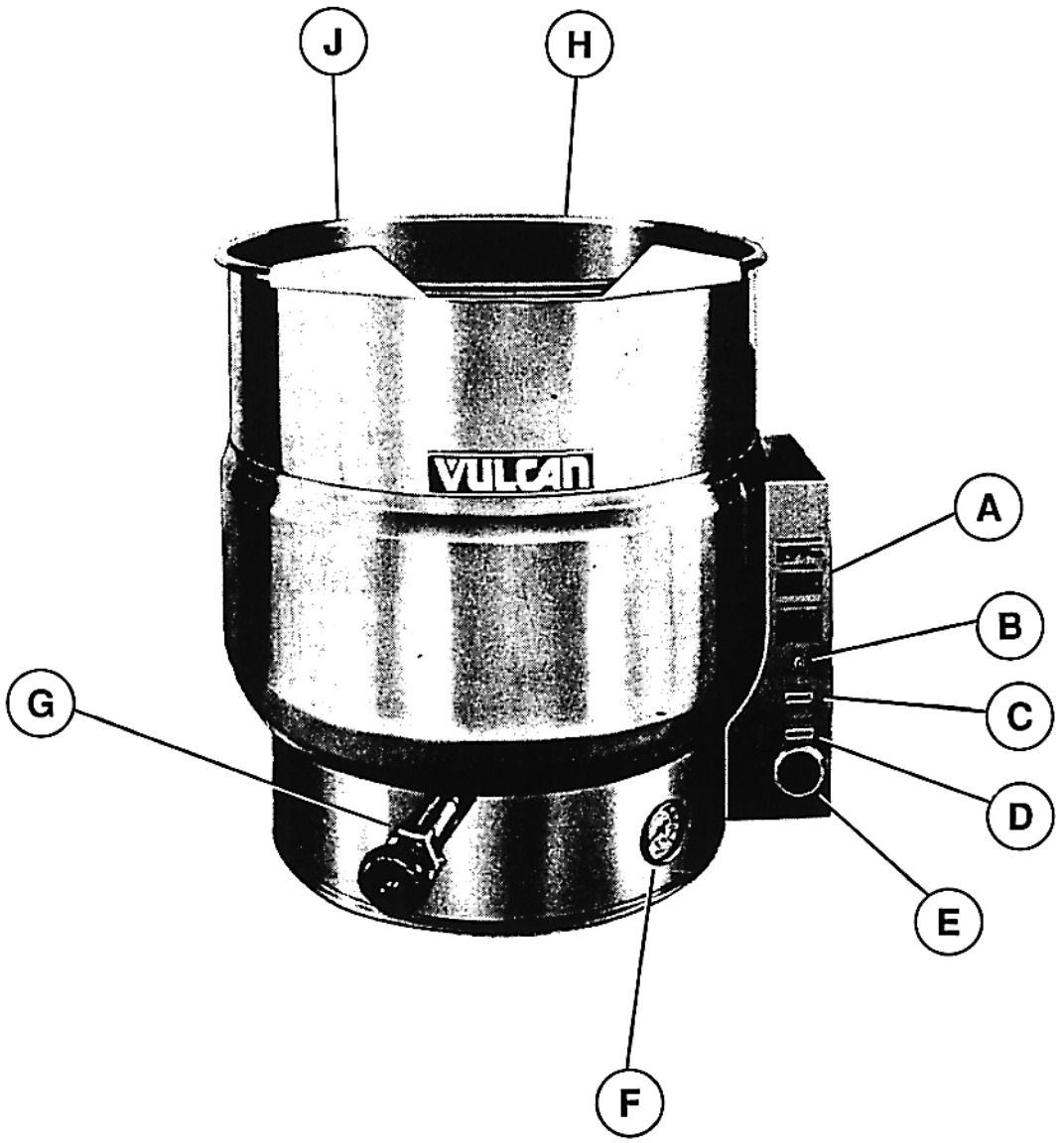
I. Turn the power "ON" and check for proper operation.

ELECTRICAL CHARACTERISTICS - 3 Phase

MODEL	208V		230V		240V		380V		415V		480V	
	KW	AMP	KW	AMP	KW	AMP	KW	AMP	KW	AMP	KW	AMP
VELT20	12	33.4	12	30.1	12	28.9	12	18.3	12	16.7	12	14.5
VELT30	15	41.7	15	37.7	15	36.1	15	22.8	15	20.8	15	18
VELT40	18	50	18	45.2	18	43.4	18	27.4	18	25	18	21.7
VELT60	18	50	18	45.2	18	43.4	18	27.4	18	25	18	21.7
VELT80	18	50	18	45.2	18	43.4	18	27.4	18	25	18	21.7


L
L
NOTE: 80 Gal. Kettles are supplied with 2 Rear Support Legs
Electrical Service Conn. (2 Locations)
VELT
Spring Assist Hinged Cover (Optional Extra)
70° REF.
A
1 1/2" 38 mm Tangent Draw Off Valve (Optional Extra)
3 EQUALLY SPACED 7/16" 11 mm Dia. HOLES ON 3" 76 mm B.C. FLANGED FEET DETAIL
Electrical Service Conn. (2 Locations)
K
G
F

CONTROLS AND SIGNALS



CONTROLS AND SIGNALS

Fig. 1: Shows physical location of the Controls, Signals and Operating features.

ITEM A: Basic kettle operating instructions permanently imprinted on the stainless steel Control housing.

ITEM B: Kettle power switch controls power to the kettle.

ITEM C: Pilot light, when lit, indicates insufficient water in kettle jacket and the sensing probe has interrupted power supply to the controls and the heating elements.

ITEM D: Pilot light functions with the thermostat knob and when lit, indicates the heating elements are on.

ITEM E: Thermostat knob allows the operator to select the kettle temperature in increments from "1" to "10", from low simmer to a rolling boil.

ITEM F: Pressure gauge indicates the vacuum in inches of mercury and pressure in pounds per square inch inside the kettle jacket.

ITEM G: The optional drawoff valve for draining food product from kettle into a container placed under the valve.

ITEM H: Air vent nut located at rear of the kettle jacket allows air to be driven from the jacket by steam should the vacuum seal be broken. See air venting instructions under Service.

ITEM J: Relief valve located at the rear of the kettle jacket opens automatically to relieve excessive steam pressure in the kettle jacket.

OPERATING

A. Check the kettle pressure gauge. The reading should indicate a 20 to 25 inch vacuum for a cold kettle. If vacuum is insufficient, Air Venting instructions must be followed. Check that the draw-off valve is closed.

B. Turn the kettle power switch to the "ON" position.

C. Preheat the kettle by turning the thermostat knob to "8" and wait until the temperature pilot light goes off.

NOTE: Food products with milk or egg base should be placed into a cold kettle and then the cooking operation begun. Avoid sudden contact of these food products with a hot kettle bowl surface because the food will stick to the surface.

D. Place the food product into the kettle. Close the kettle cover, if this option is provided.

E. Adjust the thermostat knob to the cooking temperature to be used. A setting of "6" to "7" will provide simmer and "8" to "10" will give a low to rolling boil.

F. Turn both the kettle power switch and the thermostat knob "OFF" when the food is cooked. Turn off the steam, remove the food and clean the kettle immediately to prevent residue from drying on the kettle bowl.

WARNING: THE KETTLE IS HOT. USE CARE WHEN OPERATING AND SERVICING THE KETTLE.

CLEANING

The kettle interior and exterior should be thoroughly washed after each use when a different food is to be cooked next or when cooking is completed for the day. Before cleaning check that the kettle has cooled enough to touch it.

A. Check that the power supply is "OFF".

B. Pre-rinse the inside of the kettle thoroughly and drain to remove any food particles.

C. Using a nylon brush, clean kettle with a mild detergent and warm water rinse. **Never** use steel wool or scouring powder as it will scratch stainless steel. Plain steel wool can leave small pieces of steel wool which can rust.

D. Tilt the kettle fully, or open the tangent draw-off valve if this option is provided, to allow the detergent and water solution to drain. Rinse thoroughly with clean water.

E. On a kettle that has the optional drawoff valve, turn the large hex nut counter clockwise by hand until it is completely disengaged from the threads. Grasp the valve knob and slowly pull out the valve stem and disk. Do not allow the disk to come in contact with hard surfaces as it can be damaged. Wash the valve stem, disk and handle. Insert a nylon brush wet with detergent and water into the interior of valve body and the tangent draw-off tube and brush vigorously. Replace the valve stem assembly and turn the hex nut until snug. Rinse the kettle with clean warm water. Leave the drawoff valve open when the kettle is not in use.

F. Wipe the exterior of the kettle with a clean damp cloth.

WARNING: NEVER SPRAY WATER INTO ELECTRICAL CONTROLS.

SERVICE

MAINTENANCE

No general maintenance is required other than following the cleaning procedures.

LOW WATER LEVEL

Proper water level must be maintained within the jacket for the kettle to operate. Depletion of water may occur from excessive opening of, or leakage through, the relief valve.

If the water is below the required operating level, either initially at start-up or during use, the kettle will automatically shut off, stop operating and the LOW WATER signal light will come on.

CAUTION: BEFORE ADDING WATER TO THE RESERVOIR, THE WATER SUPPLY SHOULD BE ANALYZED TO ENSURE THAT HARDNESS IS NO GREATER THAN 2.0 GRAINS PER GALLON AND THE pH LEVEL IS WITHIN THE RANGE OF 7.0-8.5. WATER WHICH FAILS TO MEET THESE STANDARDS SHOULD BE TREATED, OR USE IONIZED DISTILLED WATER WITH SODIUM. EQUIPMENT FAILURE CAUSED BY INADEQUATE WATER QUALITY IS NOT COVERED UNDER WARRANTY.

In order to operate the kettle, follow these procedures:

A. Trip the relief valve lever to relieve all pressure from the kettle jacket.

WARNING: STAND CLEAR OF THE STEAM EXHAUST, IT IS VERY HOT.

B. At the exterior rear of kettle jacket remove the nut from the air vent.

C. Insert a funnel into the air vent opening and slowly add 3 or 4 ounces of clean water. Turn the unit back on. If the low water light turns on, turn the unit off and add another 3 or 4 ounces of water. Turn on the unit. If the light comes on you still need to add water until the elements are covered and the lower water light stays off. Then turn the unit off and add the following amount of water as indicated by the model number. This amount "fills" the jacket reservoir to its correct operating water height.

VELT20 Models add 140 oz. water
VELT30 Models add 150 oz. water
VELT40 Models add 220 oz. water
VELT60 Models add 250 oz. water
VELT80 Models add 330 oz. water

D. Replace the air vent nut.

E. Follow air venting instructions below.

F. Continue the normal kettle operating procedure.

WARNING: THE KETTLE IS HOT. USE CARE WHEN OPERATING AND SERVICING THE KETTLE.

AIR VENTING

Periodically check the pressure gauge when the kettle is cold. The reading should be in the (green) VACUUM zone between 20 to 25, otherwise air is present and efficient heating will not occur.

To remove the air, set the thermostat knob at 8 and heat the empty kettle until the TEMPERATURE pilot light goes off.

Open the air vent nut one full turn for 10 seconds to exhaust air from the kettle jacket. Close the air vent nut.

EXTREMELY SLOW COOKING TIME

If the cooking time is abnormally slow, then the problem may be due to air being present in the kettle jacket. To remove the air, follow AIR VENTING instructions. If this problem persists and kettle will not reach and maintain the pressure gauge zone of 20 to 25 vacuum when cold, then assume that a slow leak may be responsible in the jacket. Check all fitting connections to jacket and also the element gasket. Tighten or replace, if necessary.

Slow cooking time may be due to a burned out heating element. Test elements and if defective, replace the element assembly.

KETTLE WILL NOT OPERATE WHEN TURNED ON

Kettle will not operate if the water level is too low in the jacket. See LOW WATER LEVEL instructions.

Initially, when the thermostat knob is dialed and the TEMPERATURE indicator light does not come on, then it may be assumed that the malfunction is due to either a defective thermostat or a loose wiring connection. If TEMPERATURE light comes on when thermostat knob is dialed fully (a setting of "10"), then eventually the kettle should reach its maximum temperature (280°F) in the jacket and a corresponding pressure reading of approximately 40 p.s.i. should register on the pressure gauge (on kettles rated at 50 p.s.i.).

Finally, when the kettle is turned "ON" and the thermostat knob is dialed, check that the contactors are being energized and power is available to the heating elements. Replace defective contactor(s).

THE DRAW OFF VALVE IS LEAKING

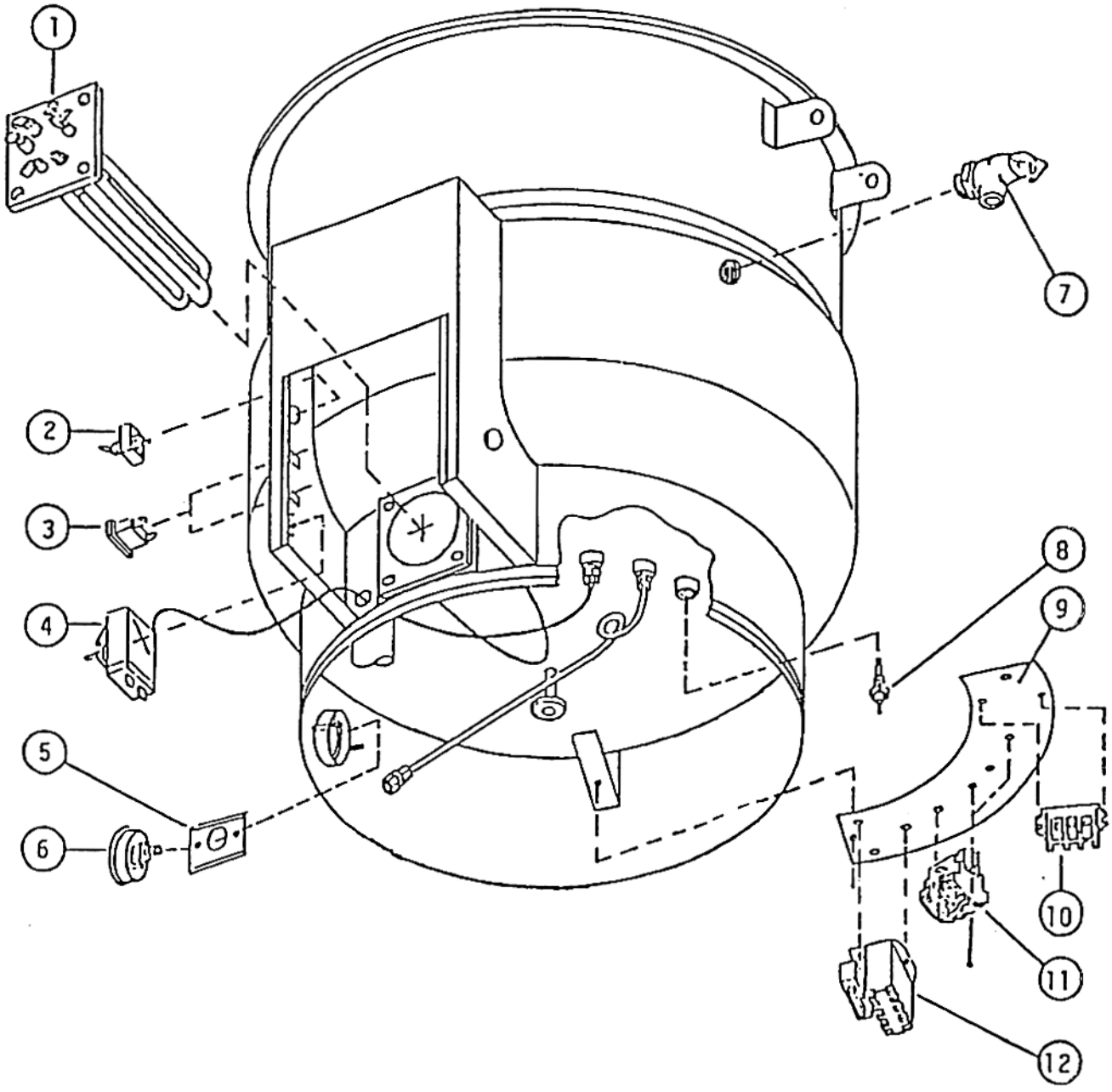
If a leak occurs through the valve stem, replace the "O" ring. If the leak is due to faulty sealing between the stem disk and valve seat, this problem can usually be corrected by cleaning off the dried on food residue with an extremely fine emery cloth. If the disk or valve seats are found to be excessively damaged, either or both must be replaced. However, if only a slight damage to either the disk or seat has occurred, then the following lapping procedure should correct it:

A. Follow CLEANING PROCEDURE under Operating and remove the knob handle from end of stem. Unscrew and remove bonnet from stem. Re-attach knob to the stem.

B. Apply fine grade lapping compound around the sealing edge of the disk and insert it into the valve, making light contact against the seat. By hand, rotate the stem disk against the valve seat, allowing the stem to wobble slightly in the space previously occupied. Repeat this step several times.

C. Reassemble, close the valve and test for leaks.

KETTLE - EXPLODED VIEW

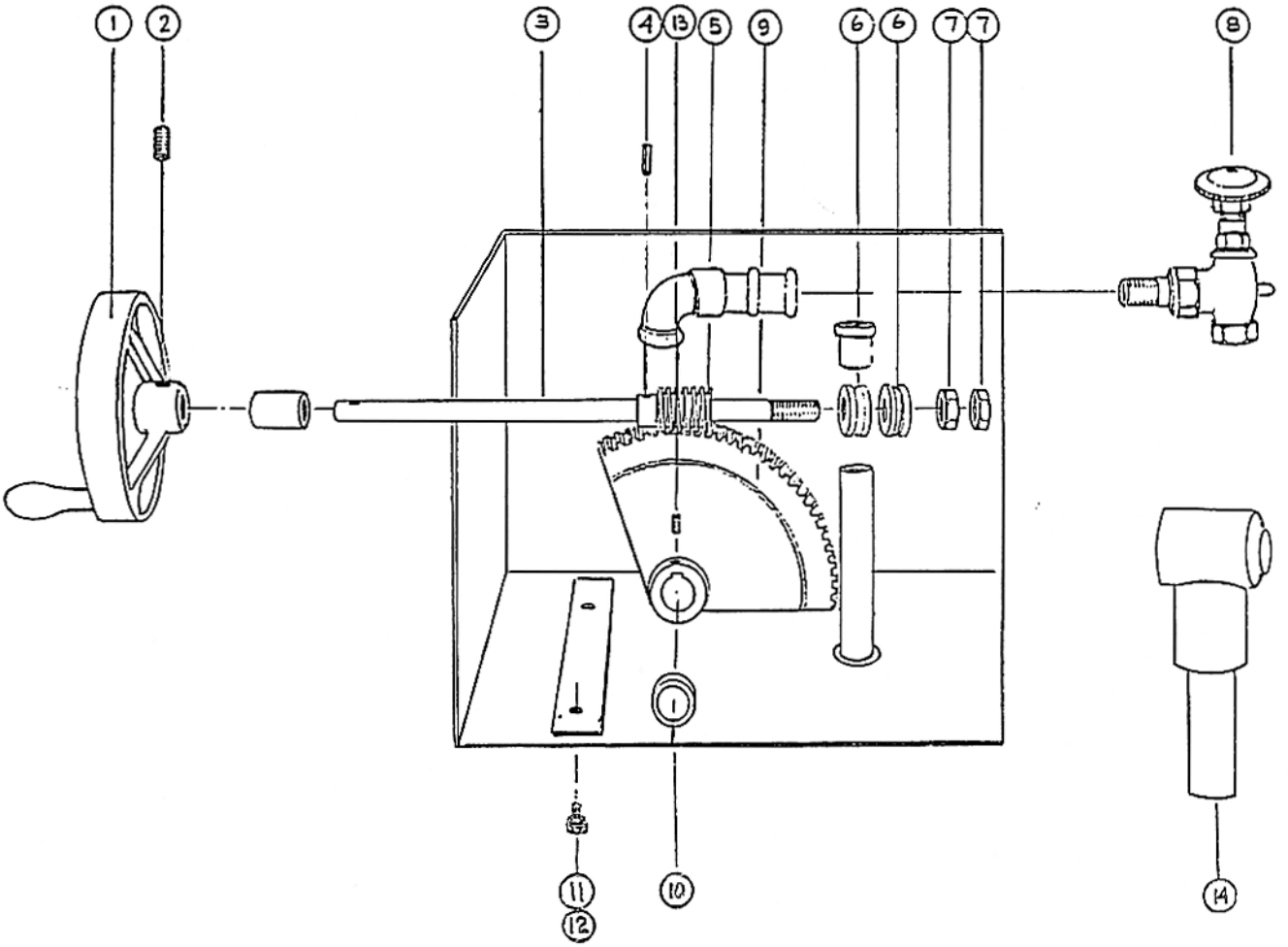


KETTLE PARTS

ITEM NO.	PART NO.	DESCRIPTION	QUANTITY
1	* 7-50xx	Element & Flange Assembly	1
2	881970	Power Switch	1
3	881972	Low Water Pilot Light &	1
	881972	Temperature Pilot Light	1
4	881973	Thermostat	1
5	836938	Mounting Plate	1
6	881979	Pressure Gauge	1
7	881980	Relief Valve	1
8	881981	Probe	1
9	836995-X	Mounting Plate (Specify Model No.)	1
10	881985	Terminal Block	1
11	* 4-CFxx	Contactor(s) (Specify Electrical Rating)	1 or 2
12	881960	Liquid Level Control	1

***NOTE:** Include serial number, model number and electrical rating when ordering replacement element assembly.

TILTING MECHANISM



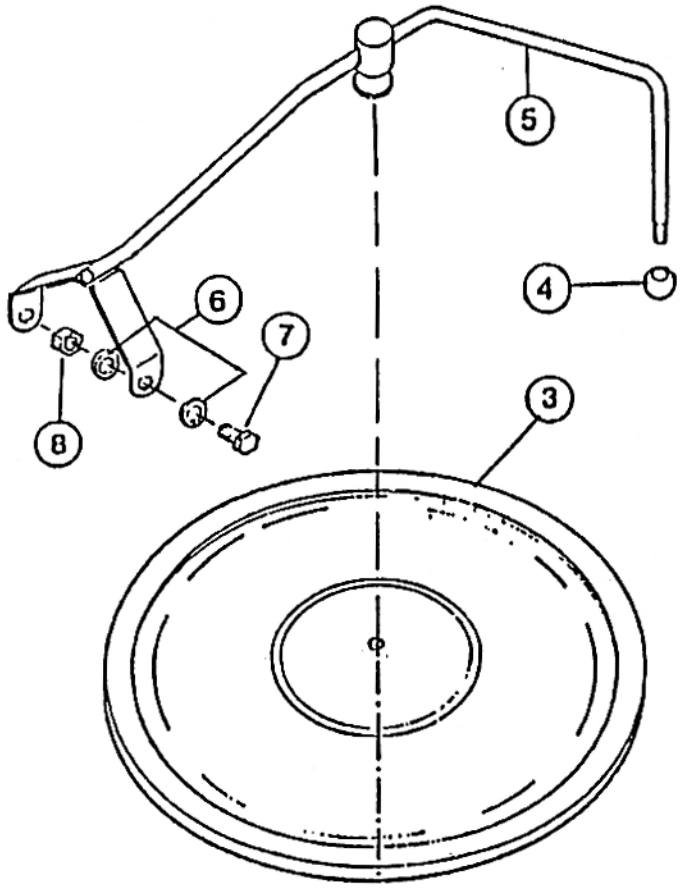
TILTING MECHANISM PARTS

ITEM NO.	PART NO.	DESCRIPTION	QUANTITY
1	881962	Handwheel	1
2	SC-047-42	Set Screw	1
3	836936	Tilting Shaft	1
4	836952	Tension Pin	1
5	881965	Worm Gear	1
6	881963	Thrust Bearing	2
7	NS-013-50	Jam Nut	2
8	881984	Steam Control Valve	1
9	881964	Large Segment Gear	1
10	836971	Spacer Collar	1
11	SC-090-12	Fastening Bolt	4
12	WL-004-06	Lock Washer	4
13	SC-047-42	Set Screw	1
	836949	Key (Not Visible)	1
	881967	"O" Ring (Not Visible)	4
14	836970	Outboard Bearing	1

Note: Item No. 14, Outbore Bearing as shown, is standard for all kettles without Hinged Covers. If option of Hinged Cover has been exercised, specify part number as well as Model and Capacity of Kettle when ordering this part.

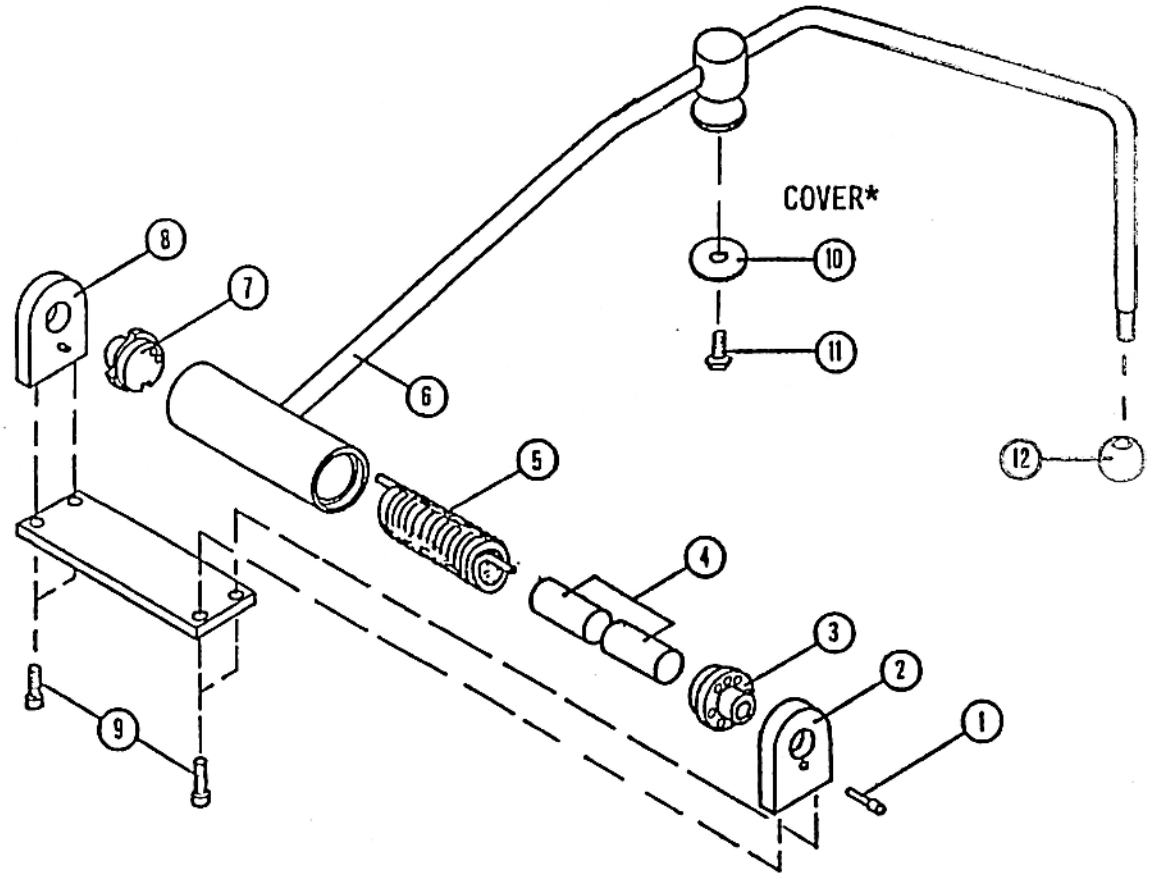
* Small Segment Gear is used on 20, 30 and 40 Gallon Kettles
* Large Segment Gear is used on 60, 80 and 100 Gallon Kettles

COUNTERBALANCED HINGED COVER (Optional)



ITEM NO.	PART NO.	DESCRIPTION	QUANTITY
3	836994-X	Cover (Specify Model No.)	1
4	836964	Knob	1
5	836984-X	Handle Assembly (Specify Model No.)	1
6	WS-007-20	Fiber Washer	4
7	SC-041-42	Bolt	2
8	NS-015-16	Nut	2

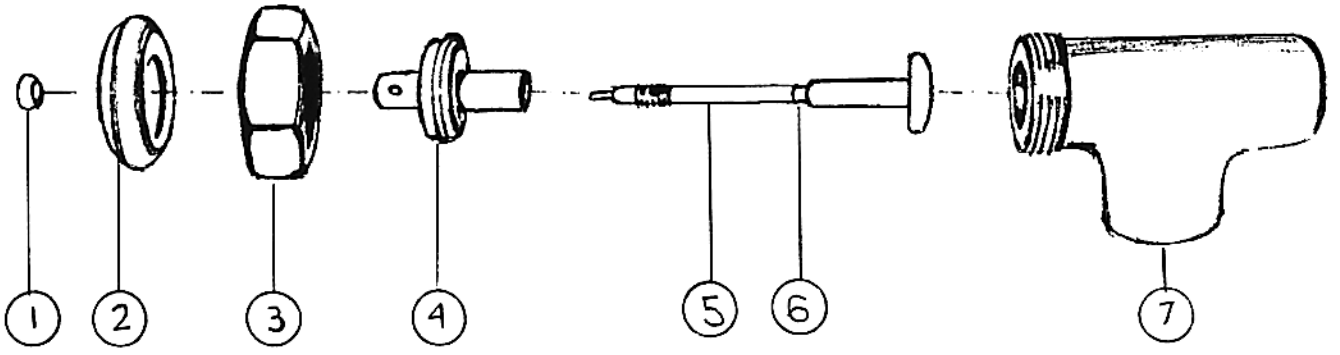
SPRING ASSIST HINGE ASSEMBLY (Optional)



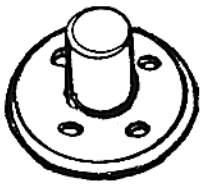
ITEM NO.	PART NO.	DESCRIPTION (20 to 40 Gal. Kettles)	QUANTITY
1	836977	Lock Pin	1
2	836978	End Lock Plate	1
3	836979	Stationary Disc	1
4	836980	Cores	2
5	836981	Spring	1
6	836982-X	Handle Assembly (Specify Model No.)	1
7	836983	Rotary Disc	1
8	836932	End Stop Plate	1
9	SC-041-50	Cap Screws	4
12	836964	Knob (Also 60 to 100 Gal. Kettles)	1

ITEM NO.	PART NO.	DESCRIPTION (60 to 100 Gal. Kettles)	QUANTITY
1	836986	Lock Pin	1
2	836987	End Lock Plate	1
3	836988	Stationary Disc	1
4	836989	Cores	2
5	836990	Spring	1
6	836991-X	Handle Assembly (Specify Model No.)	1
7	836992	Rotary Disc	1
8	836993	End Stop Plate	1
9	SC-041-01	Cap Screws	4
	836994-X	Cover (Not Shown-Specify Model No.)	1

DRAW-OFF VALVE AND FLANGED FOOT

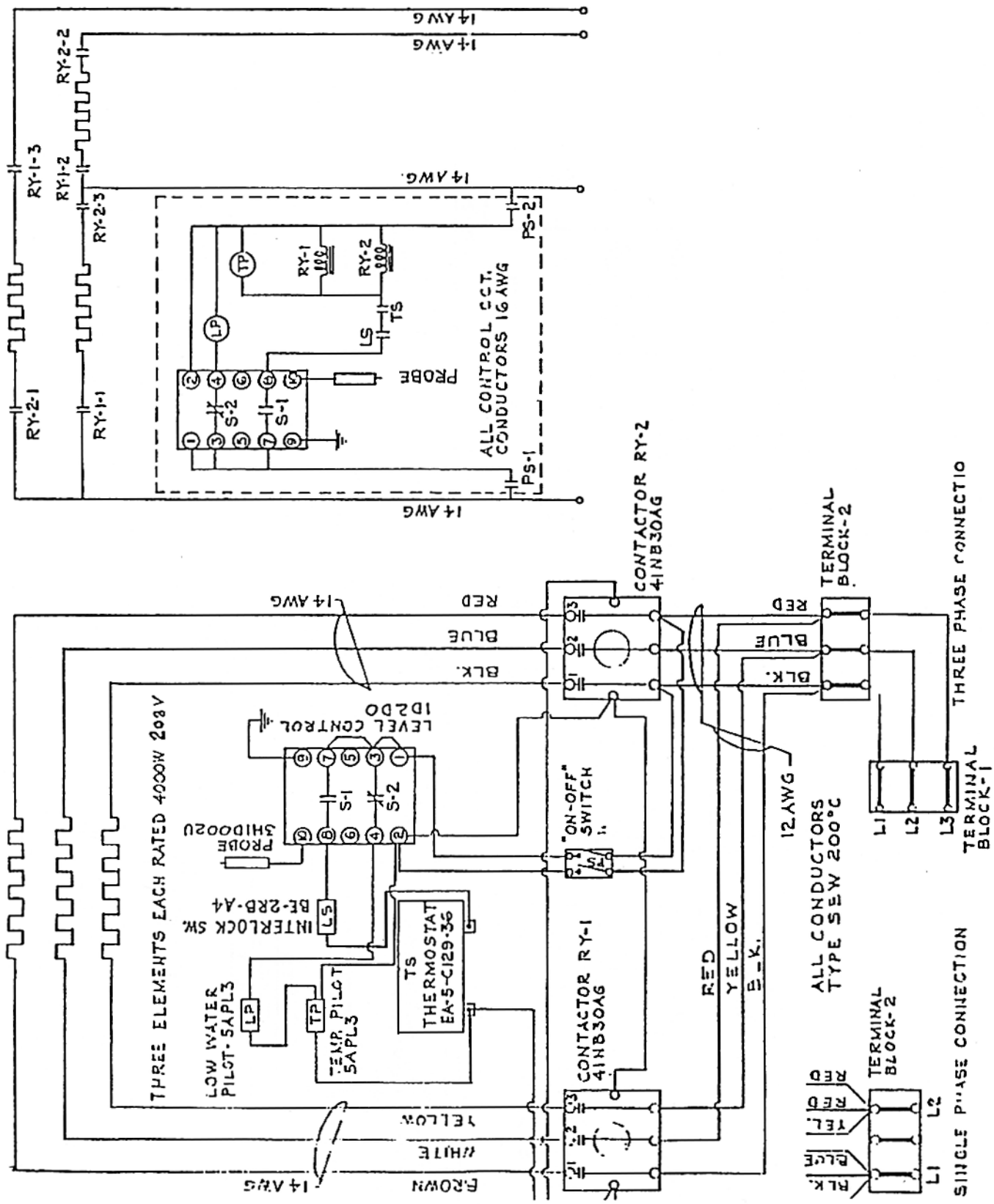


ITEM NO.	PART NO.			DESCRIPTION	QUANTITY
	1" Valve	2" Valve	3" Valve		
1	836939	836939	836940	Nut	1
2	836967	836967	836942	Handle	1
3	836943	836944	836945	Hex. Assembly Nut	1
4	836946	836947	836948	Bonnet	1
5	836965	836950	836951	Disc & Stem Assembly	1
6	836966	836953	836954	"O" Ring	1
7	836955	836956	836957	Valve Body	1

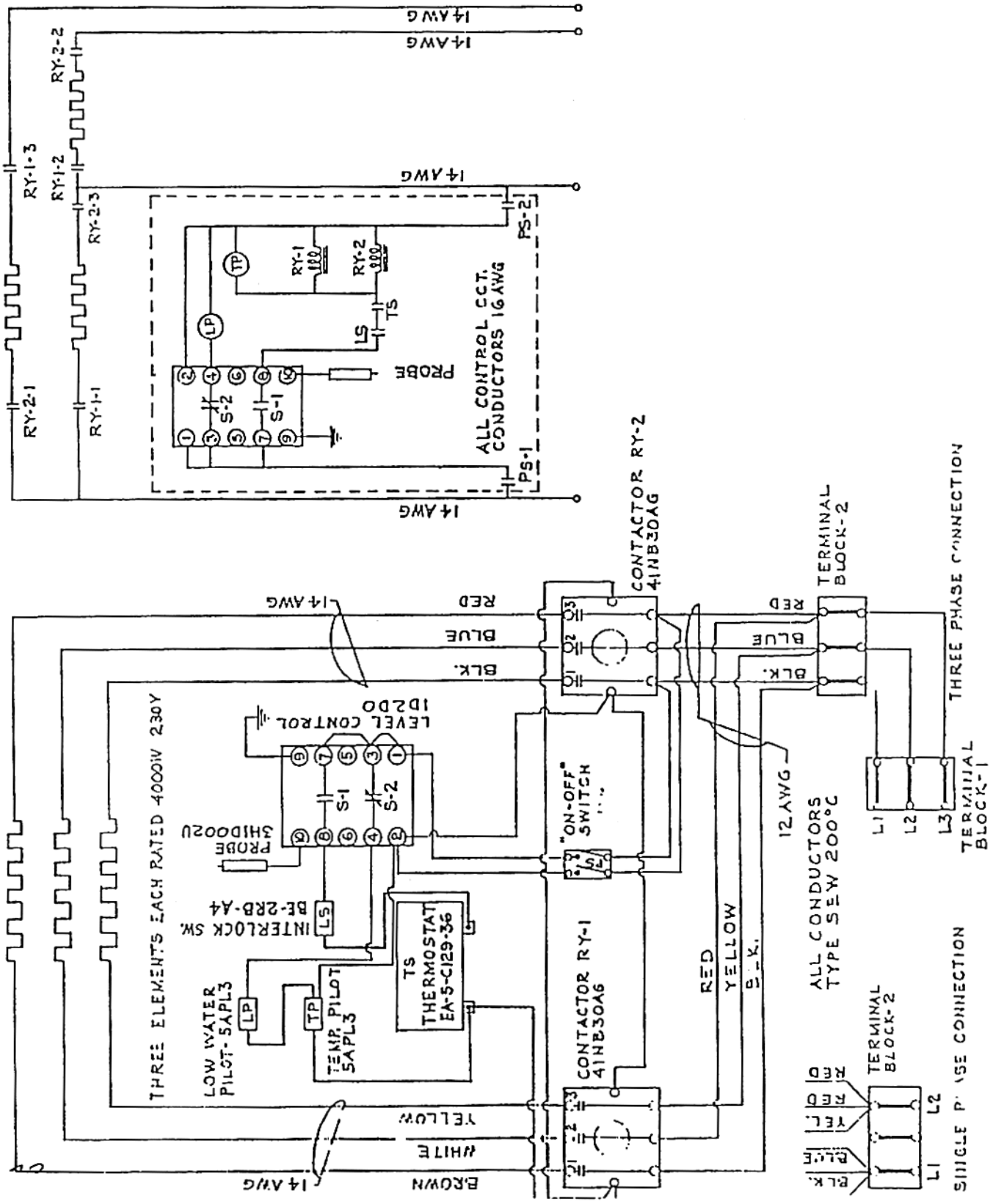


PART NO.	DESCRIPTION	QUANTITY
836958	Flanged Adjustable Foot	3

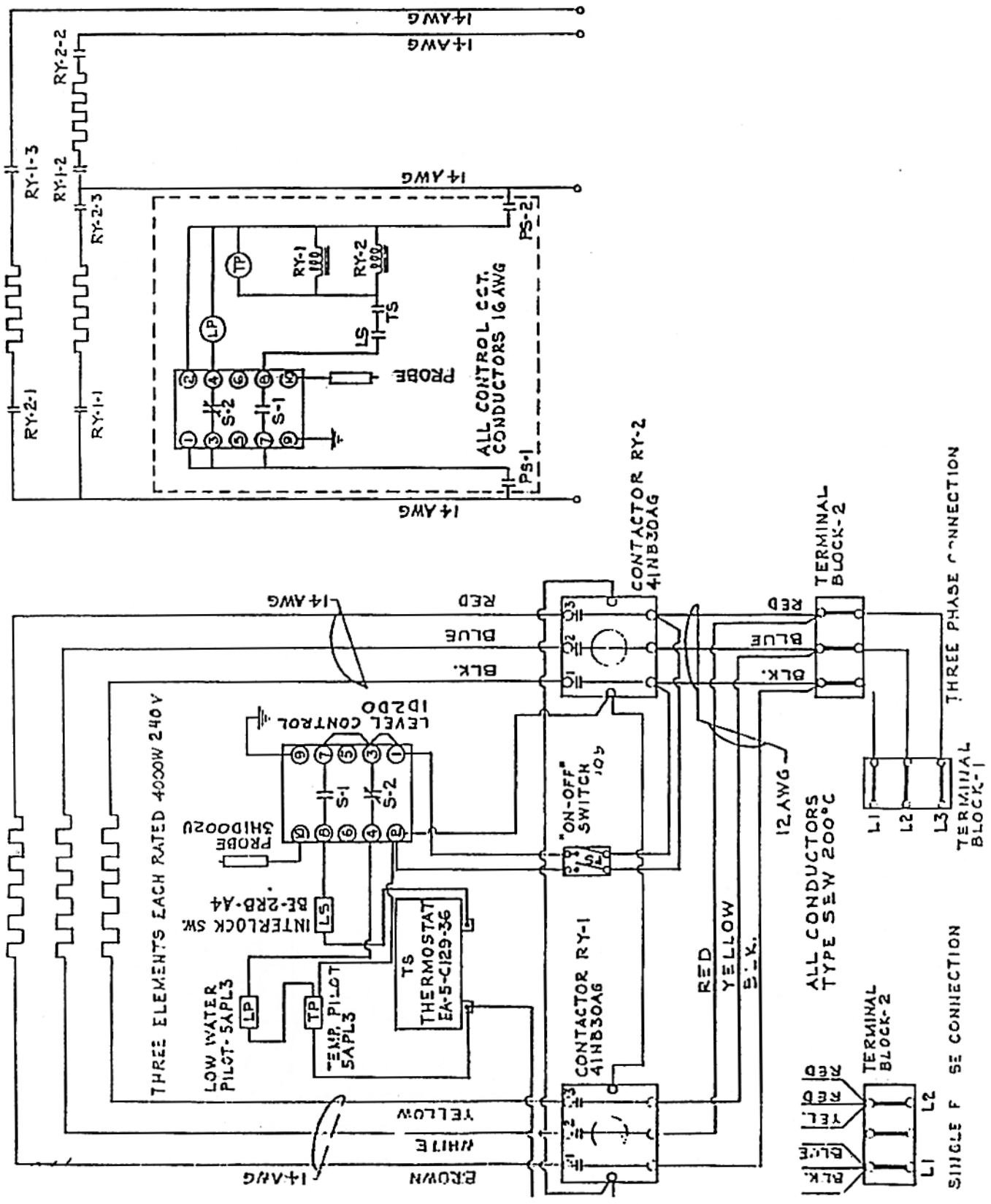
WIRING DIAGRAM VELT 20 - 208 VOLTS - 12 KW



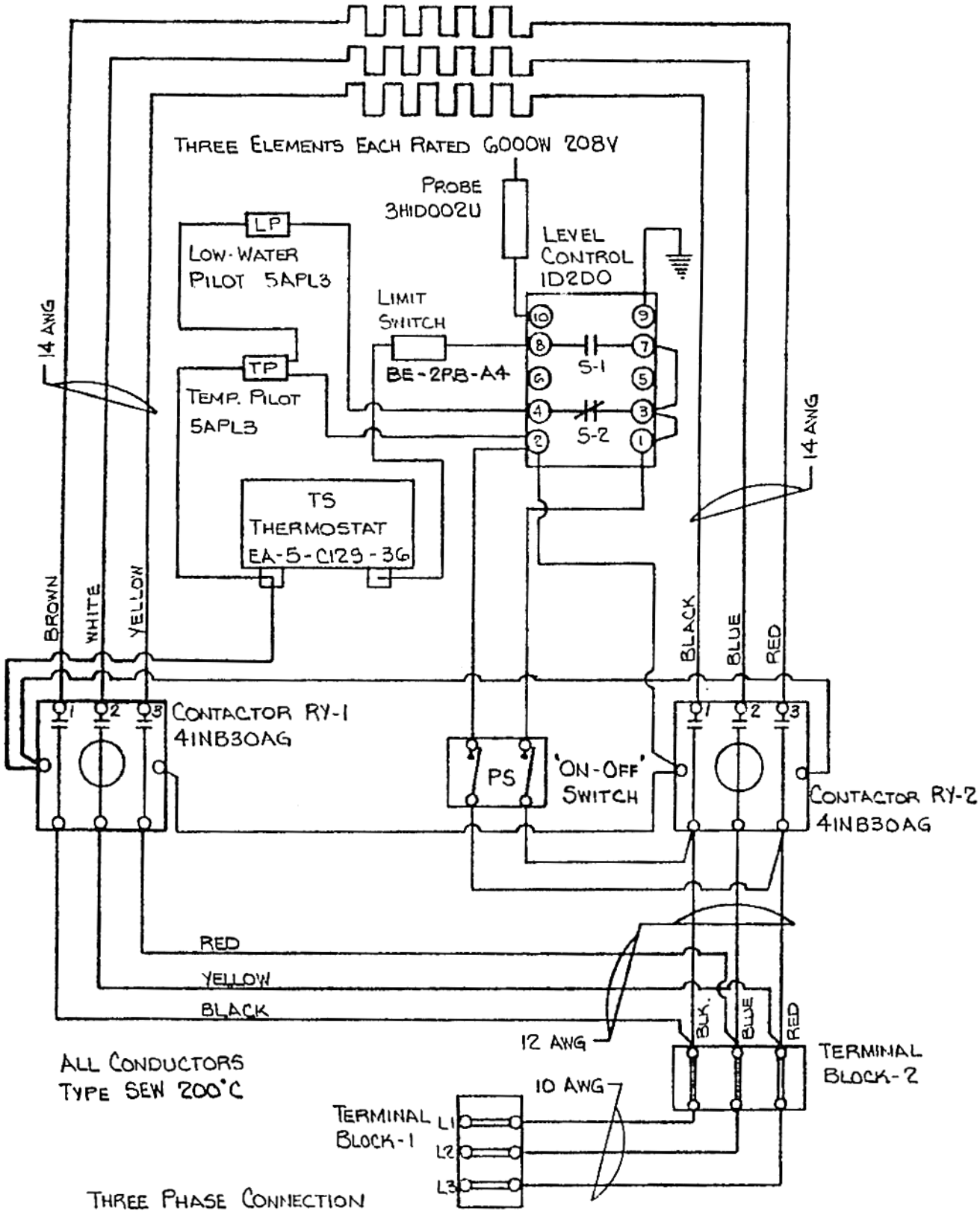
WIRING DIAGRAM VELT 20 - 230 VOLTS - 12 KW



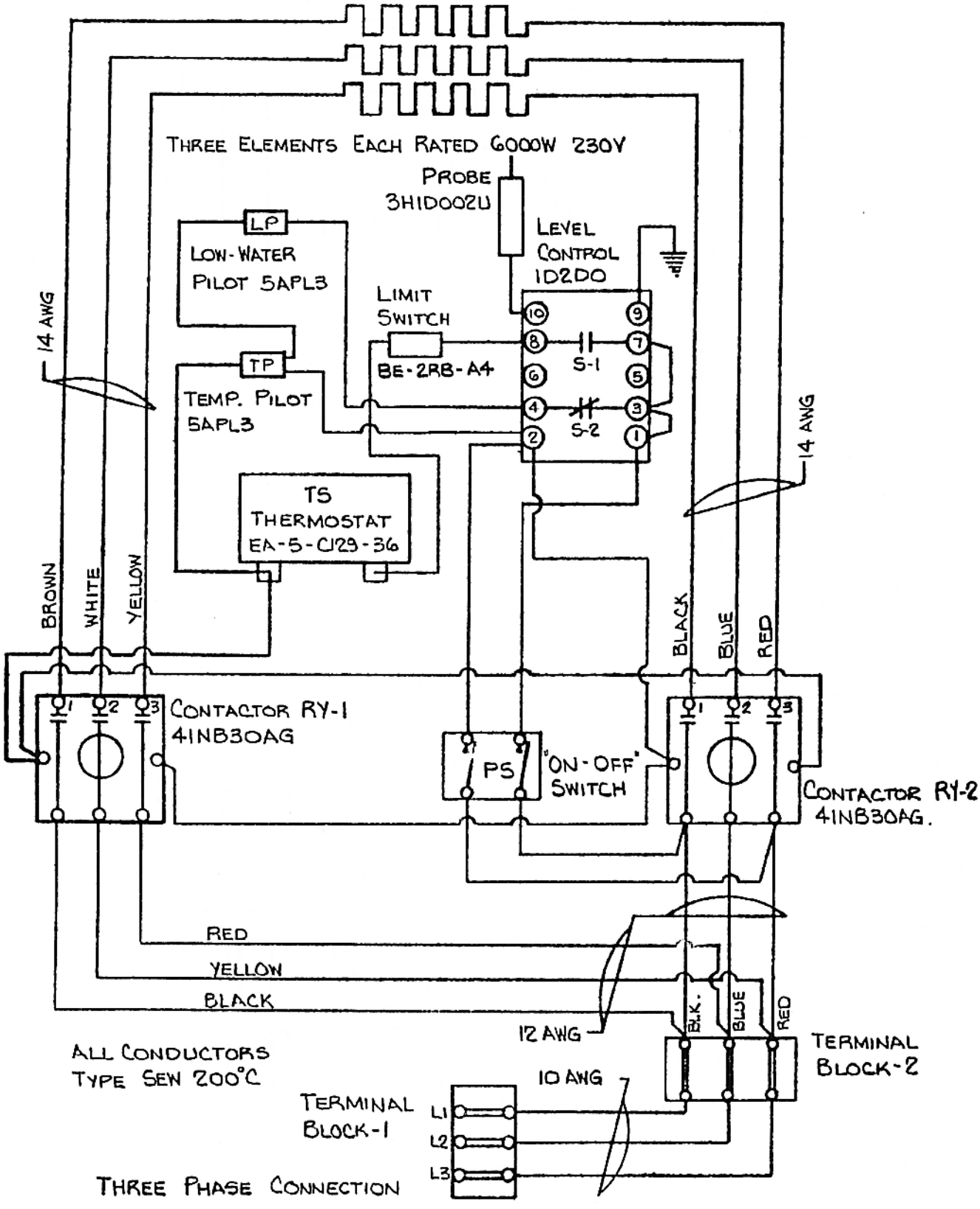
WIRING DIAGRAM VELT 20 - 240 VOLTS - 12 KW



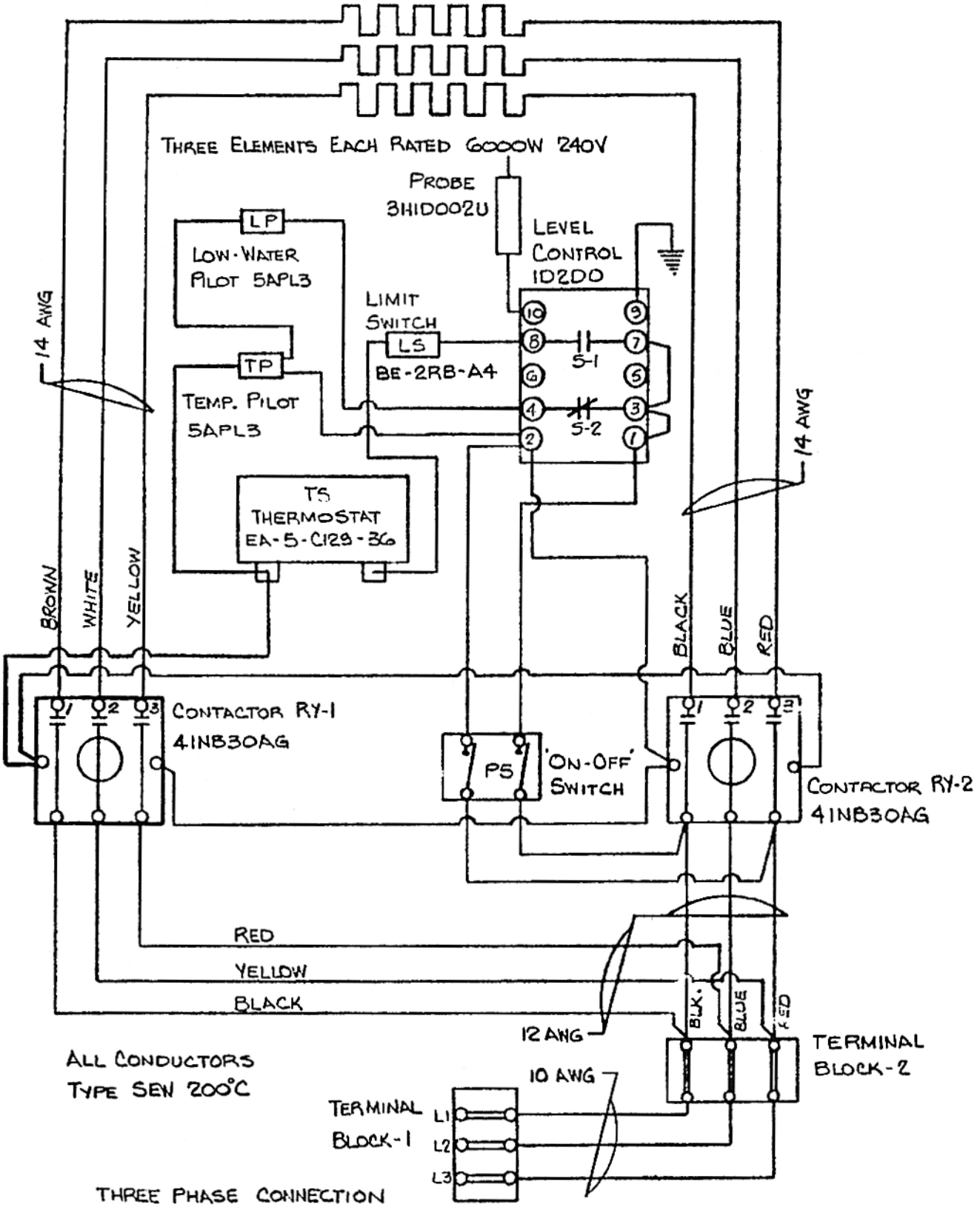
WIRING DIAGRAM VELT 40, 60, 80 - 208 VOLTS - 18 KW



WIRING DIAGRAM VELT 40, 60, 80 - 230 VOLTS - 18 KW



WIRING DIAGRAM VELT 40, 60, 80 - 240 VOLTS - 18 KW



THIS
PAGE
INTENTIONALLY
LEFT
BLANK

THIS
PAGE
INTENTIONALLY
LEFT
BLANK